

THE RELATIONSHIP BETWEEN CHOLECYSTITIS, JAUNDICE AND GALL-STONES.

By ARCHIBALD MacLAREN, M.D.,

OF ST. PAUL, MINN.

THERE are a few points in the surgery of the biliary tracts that have proven of more than ordinary interest to me.

First in regard to the relationship between jaundice and gall-stones. My early impressions in regard to this subject as derived from text-books, left me with the idea that jaundice, more or less pronounced, was a necessary symptom of gall-stones. The teachings of to-day are not quite so decided, although most medical authorities are far from satisfactory when consulted upon this point. For instance, in Pepper's "System of Medicine," in speaking of the symptomatology of cholecystitis, he says, "inflammation of the gall tracts or gall-bladder is first announced by jaundice, which increases in intensity and color." Again, under the head of cholelithiasis he says, "jaundice is present in about one-half of the cases, and begins within a few hours after the onset of pain; it soon disappears unless the stone becomes impacted or encysted in the common duct, when it may proceed for months."

This statement, although somewhat qualified later, leaves one with the impression that jaundice is, to say the least, a most important symptom in making a differential diagnosis, and that in cholelithiasis the stone usually migrates.

Mayo Robson also leaves us with much the same impression when, in his work on the "Diseases of the Gall-bladder," he says that gall-stones are probably always accompanied by bladder inflammation, and this gives rise to a thick, ropy mucus, which in passing causes slight attacks of pain and jaundice. Further, he says that although jaundice in cholelithiasis is

usually produced by stones, it is frequently due to a catarrhal inflammation and thickening of the mucous membrane.

My own observations go to prove that these and similar text-book statements leave the impression on most medical minds that jaundice is a much more important symptom than it is in reality.

I have frequently been met with the remark that such and such a patient could not have gall-stones because he or she had never had jaundice.

Now there can be no question that jaundice is a very much overrated symptom, nor that many patients pass through an attack of cholecystitis and later carry stones for years without any discoloration of either the eyes or the skin, for since April 1, 1899, I have operated upon nine cases of gall-stones, and in not one of these cases has there ever been any jaundice at all. The reason for this may be the fact that probably none of them have passed gall-stones.

I am inclined to believe that the passage of gall-stones is rather an unusual occurrence. That when we speak of a patient as having biliary colic, we are apt to believe that the colic is due to the passage of gall-stones.

That such is not always the fact would be proven by these few cases, because in almost all of them, either through stricture or through wedging a stone in the cystic duct, the gall-bladder was shut off from the other biliary tracts. Still, all of these patients had suffered intense colic, and nearly all of them before operation had at different times to be relieved by hypodermic injections of morphine, several needing as high as a grain and one-half to two grains, before they were relieved from the pain. All of these cases gave the symptoms which are usually ascribed to the passage of gall-stones; in most of them the feces were washed and strained through a sieve without finding a single stone, and, further, the conditions found at the operation were such as to preclude the possibility of the passage of a stone.

In all but one case the gall-bladder was found inflamed, thickened and frequently adherent to the neighboring organs, in one case producing a mechanical dilatation of the stomach,

through the influence of adhesions which existed between the gall-bladder and the pylorus, the conditions found to be present showing that the pain from which these cases had suffered was due to the cholecystitis, and not due to the passage of gall-stones. On the negative side of the question, most of the few operations I have done for chronic jaundice have proven to be inoperable malignant cases, usually of the liver. And in all of them the operation did no good, the patient dying in a few weeks. One other case, a patient of Dr. Solberg's, of St. Paul, proved not to be due to the liver at all. The pronounced jaundice with discoloration of the sclera and itching of the skin which had lasted for eight months was found to be due to a chronic suppurative appendicitis. The patient soon died after the operation, and a post-mortem examination demonstrated that there was no disease of the liver or the biliary passages, but that the jaundice was septic in character. Jaundice, due to the incarceration of gall-stones in the common duct, producing the ball-valve obstruction to the outflow of bile, which has been so well described by Fenger, is, I am sure, rare in comparison with the great majority of gall-stone cases. I have never found a stone in the common duct, and I do not believe that gall-stones migrate nearly as frequently as we have been inclined to believe.

I have found gall-stones impacted in the cystic duct several times; these have been removed through the gall-bladder without much difficulty, although it was necessary to crush most of them before they could be delivered. In one case it was necessary to incise the cystic duct before the stone could be removed. This case is one that was operated upon several years ago, and is the only case of gall-bladder surgery which has died after operation. This woman, like most of the others, was suffering an attack of cholecystitis at the time of the operation, and an infection caused an acute peritonitis, from which she died on the third day.

In the last case operated upon, six stones were found in the gall-bladder, while one of the same size, and fascettted like the others, was found embedded in the under surface of the liver, where it had become encapsulated after ulcerating its

way out of the gall-bladder. The relationship of cholecystitis and gall-stones is a most interesting and fruitful point for study and research. Clinically it would appear to me that inflammation of the gall-bladder is the first step in the majority of cases, and that the gall-stones are a secondary product of this inflammatory condition, being therefore a symptom rather than a disease. And since my attention has been called to this apparent relationship I have seen only one case which did not show either past or present evidences of inflammatory action of the gall-bladder.

This woman was a patient of Dr. Parks, of Downing, Wisconsin, was twenty-seven years of age, married sixteen years, two children, four miscarriages, the last being a criminal abortion, about one year ago. She has been very much of an invalid ever since that time, being confined to her bed the last month, suffering from constant pain in the left side which runs around to the small of the back. She has had constant pain in the pelvis, and a very irritable bladder, which necessitated her being up four or five times every night. Examination of the urine showed that it was practically normal. She had a retro-displaced, adherent uterus, and an enlarged movable right kidney. On November 10 we put her to sleep and examined the bladder, which was found to be normal, at the same time we catheterized the left ureter, the catheter being left in place over an hour without getting any urine. From this examination we were inclined to believe that the right kidney was doing all of the work.

On the 16th of this same month she was again anesthetized and a laparotomy was made, the adherent uterus was liberated, the universal pelvic adhesions were separated and the left appendage was removed.

Wearing a rubber glove, I then introduced the whole hand into the abdomen for the purpose of examining the kidneys. They were found to be normal in size and gave no evidence of disease, but a gall-stone as large as a hickory-nut was found in the gall-bladder.

A. Bevan's incision was now made over the gall-bladder, which was found to be absolutely free from any evidence of inflammatory action.

This gall-stone was covered with numerous sharp points of cholesteroline crystals and looked very much like a small chestnut bur. If any gall-stone could mechanically produce an inflammation this

stone certainly ought to have done so, while her history showed that she never had had the slightest pain from it, nor had given any of the ordinary symptoms of gall-stones.

Infection from micro-organisms may reach the gall-bladder, either from the intestine or through the blood-current, probably the latter is the most frequent route, the germs being filtered out of the general circulation by the liver. They then accumulate in the gall-bladder, the bile being proven to be a good culture medium, where, under favorable circumstances, they overpower the normal protecting endothelial cells and light up an attack of typhoidal, streptococcus, coli commune, or mixed cholecystitis. After a time the germs become attenuated, and later they clump to form a nucleus, around which cholesterine and the bile salts accumulate and form the nuclei for stones. A few points taken from medical literature that would go to prove this hypothesis are as follows: Cushing injected a culture of bacillus typhosus into the ear vein of a rabbit and in forty-eight hours found a pure culture of typhoid bacilli in the gall-bladder and duodenum. Other similar experiments were negative, but they would not offset one positive one. Flexner has obtained culture of typhoid bacillus from the bile in fifty per cent. of all fatal cases of typhoid fever in Johns Hopkins Hospital. Cushing found typhoid bacilli in the gall-bladder in cases operated upon for gall-stones, where the patient had never had typhoid fever.

Miller reports a case in which the bacillus typhosus was present in the gall-bladder seven years after an attack of typhoid fever. Von Bungen cites a similar case after fourteen and one-half years.

Chiri, Zeit and Hielk in twenty-two cases of typhoid found typhoid bacilli in the gall-bladder in nineteen, fifteen of which proved to be a pure culture. Westcott reports seventy-four cases of typhoid infection of the gall-bladder accompanying or following typhoid fever, of these thirty cases resulted in perforation; four were operated upon, three recovered, and one died, and twenty-six not operated upon all died. Gall-stones were found in eighteen of these seventy-four cases.

Different observers have found both living and dead micro-organisms in gall-stones. Dr. Henry S. Cushing, Assistant Surgeon of Johns Hopkins Hospital, now offers additional proof of the inflammatory origin of gall-stones by producing artificial stones. He says :

I am able to show to the Society some small biliary calculi of typhoidal origin obtained from the gall-bladder of rabbits, in both cases at the time of inoculation the biliary apparatus having been intentionally maltreated.

On one occasion the organisms (non-attenuated) were inoculated directly into the gall-bladder(?), which had to be held tightly for some time by a piece of gauze between the fingers to prevent leakage after the syringe was withdrawn.

At the autopsy, eight weeks later, three small millet-seed concretions were found adherent to the mucosa of an inflamed thickened and distended gall-bladder.

The second case (rabbit IX) is as follows :

March 17, 1898.—Inoculation of one cubic centimetre of twenty-four hour bouillon culture of bacillus typhosus into ear vein.

March 19.—Laparotomy. No evidence of inflammation. Culture and cover slips from gall-bladder and duodenum were negative for micro-organisms. Considerable traumatism of gall-bladder.

March 21.—Second inoculation of one cubic centimetre of eighteen-hour culture of bacillus typhosus into ear vein. Animal quite ill subsequently, but recovered.

June 13.—Widal reaction positive. Laparotomy. Marked evidence of cholecystitis. Gall-bladder bound up by adhesions in lappets in liver and identified with difficulty. One cubic centimetre of pale bile aspirated from the gall-bladder. Stained preparations showed a few rod-shaped organisms. Cultures: bacillus typhosus.

June 14.—Animal found dead. Autopsy. Peritonitis. Serosa greatly bile-stained. Gall-bladder thickened, congested and densely adherent to liver.

Contents: Small amount of pale mucoid material and three gall-stones. The largest is dark-colored, somewhat irregular in shape, measuring three millimetres in its longest diameter.

Decomposition had set in and bacterial observations were not made.

In conclusion I would like to report two cases of cholecystitis, in the first of which no gall-stones were found, the inflammatory process having not sufficiently subsided to allow of the attenuation of the germs and the formation of stones. While in the second case, where the acute process had but lately passed, leaving a subacute cystitis, the stones were evidently just commencing to form.

The first case, Mrs. O., was operated upon in March, 1898; patient of Dr. Henderson, forty years of age, had suffered from several attacks of biliary colic, usually accompanied with mild jaundice; the present attack commenced two weeks ago, the last few days becoming very serious, having had three rigors in the last thirty-six hours; temperature ranging between 104° F. and 105° F., her pulse between 130 and 140.

The gall-bladder was inflamed, the walls were very much thickened, recent adhesions existed between the gall-bladder and all the neighboring organs. Cholecystotomy was done, and the gall-bladder drained with a rubber drainage-tube. No gall-stones were found in the gall-bladder, and the patient promptly recovered and has had no further trouble with the gall-bladder.

The second case, Mrs. N., a patient of Dr. Beals, of West St. Paul, operated upon November 23, 1899, twenty-four years of age, had two children, the youngest one three months of age. Following the delivery of the last child this woman had a mild puerperal sepsis; she soon commenced to have pain in the gall-bladder, and has continued to have attacks of biliary colic ever since; had a constantly elevated temperature and pulse; the gall-bladder was found to be contracted back under the edge of the liver; the walls of the gall-bladder were a quarter of an inch thick; recent adhesions all over the gall-bladder, attaching it to the pylorus, producing a secondary dilatation of the stomach. Cholecystotomy showed that there was present an ounce of muco-purulent fluid; three small, hard, dark-colored gall-stones were found and removed, and a few days later five similar stones were found in the dressing. These stones were uniform in size and about as large as No. 4 bird-shot.

This patient promptly recovered and the sinus closed in four weeks.